

Rent-Seeking in the U.S. Atlantic Sea Scallop Fishery

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Abstract. Rent-seeking in the U.S. Atlantic sea scallop fishery is described. Resource and trade disputes caused the U.S. fishing industry, including scallopers, to lobby Congress for extended federal jurisdiction in 1977. The sea scallop fishery soon overcapitalized as fishermen captured non-exclusive resource rents. Limited entry was introduced in 1994, but an asymmetric distribution of potential wealth has blocked transferability of effort quotas as a means to eliminate excess fishing capital. Rent-seeking is now focused on transferability and a formative zoning policy that grants entitlements to marine resources, including marine protected areas which are advocated by environmental organizations.

Keywords: rent-seeking, scallop fishery, property rights

1. INTRODUCTION

Rent-seeking in the U.S. Atlantic sea scallop fishery (sea scallop fishery) is described. Originally studied in monopolies and import markets (Krueger 1974; Tullock 1967), rent-seeking is also recognized where government policies allocate natural resources (Boggess 1995; Gardner 1997; Rausser 1982), including in fisheries (Hannesson 1985; Johnson and Libecap 1982; Karpoff 1987).

Section 2 briefly discusses rent-seeking theory and the behavior in marine fisheries. The history and management of the sea scallop fishery is sketched in Section 3. In Section 4, rent-capture that took place subsequent to the Fishery Conservation and Management Act (FCMA) of 1976 is examined using an empirical interpretation of Cheung's (1970) conceptual model of open access fishing behavior. Subsequent efforts by industry to establish marketable effort quotas are examined in Section 5, including the impasse created by an asymmetric distribution of potential wealth. Section 6 summarizes the findings and anticipates a formative zoning policy that grants entitlements to marine resources.

2. RENT-SEEKING IN MARINE FISHERIES

Rent-Seeking Theory

Rent-seeking is behavior that, from a social welfare

standpoint, is generally thought to waste scarce productive resources in efforts to transfer economic rents or create artificial scarcity through government aegis (Buchanan et al. 1980; Colander et al. 1984; Rowley et al. 1988). Resources devoted to rent-seeking have opportunity costs, but they do not contribute to the total output of an economy. In a public choice context, rent-seekers demand wealth transfers, artificial scarcities, and protections from legislative or regulatory monopoly suppliers of entitlements, subsidies, and tax relief (Buchanan 1980; Gardner 1997).

The rent-seeking literature dates back only three decades when Tullock (1967) wrote that in addition to the "Harberger deadweight loss," the total cost of monopoly power includes expenditure of resources used to lobby elected officials and government agencies. Similarly, Krueger (1974), who coined the phrase, showed that the total welfare cost of import restrictions is equal to that of an equivalent tariff plus the resources used to compete for import licenses or quotas that are allocated by government. Both authors theorized that aggregate rent-seeking costs could negate rents gained from market power.

Rent-seeking is not confined to established markets, however, where the inputs and outputs of production are privately-owned. It is also found where the use of non-exclusive scarce natural resources is allocated by government. Natural resource management by the public sector is an interesting subject for the study of rent-seeking because it takes government to grant entitlements in order

to prevent resource rents from being dissipated in ways described by Gordon (1954) and Cheung (1970).¹ However, property rights usually evolve incrementally due, in part, to high transaction costs when claimants are numerous and heterogeneous and when gains or losses are asymmetric (Libecap 1989). Anderson and Hill (1983) therefore reasoned that rent-seeking is likely to dissipate future resource rents when access is controlled by government officials or other non-claimants who do not bear the costs of inefficiencies.

Incidence in marine fisheries

Rent-seeking in U.S. marine fisheries dates back to at least 1938 when the Alaska salmon cannery industry lobbied the U.S. Congress and Department of State to have Japan withdraw its fleet from Bristol Bay (Chapman 1969). In the decades to follow, the State Department negotiated several international fishing treaties and agreements, including at the United Nations' Conferences on the Law of the Sea (Hollick 1978). In 1976, Congress passed the FCMA which restricted foreign fleets from "virtually vacuuming the seas of precious life and economic value" (Magnuson 1977: 432). Imports were also believed to have a "significant impact on the United States balance-of-trade deficit, not to mention the economic damage to United States fisheries" (Magnuson 1977:431). Where sea scallops were concerned, Canadian fishermen landed more product from Georges Bank than their U.S. counterparts (Figure 1), and most of what was landed was exported to New England where it lowered dockside prices (Edwards 1981).

Rent-seekers or their representatives can be broadly classified as commercial fishermen, recreational fishermen, native peoples, processors, and environmentalists, but these categories could be easily subdivided by target species, technology, and/or geography (e.g., home port). Rent-seekers serve on the Regional Fishery Management Councils established by the FCMA, attend management meetings, form organizations, employ lobbyists, sue the Secretary of Commerce and the federal marine fishery agency, the National Marine Fisheries Service (NMFS), and hire consultants on a continuing basis in vigorous competition for preferential access rights, quotas, and gear and area restrictions, and for habitat protection, marine

reserves, and preservation of marine mammals and endangered species. Furthermore, it is constantly necessary to protect advantages or to undermine or reverse adverse regulatory actions.²

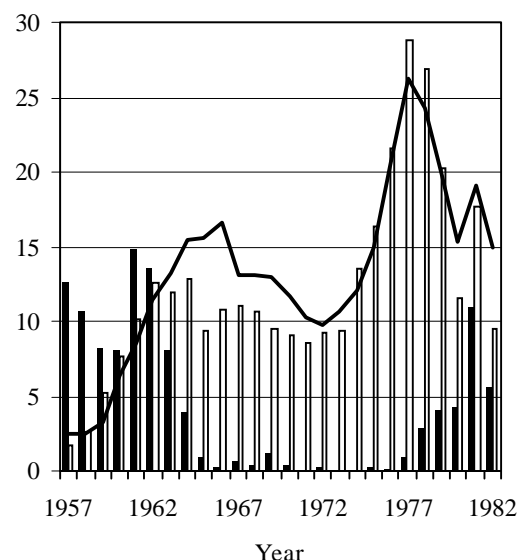


Figure 1: Canadian (hollow bars) and U.S. (dark bars) landings of sea scallops from Georges Bank, and Canadian exports (line) to the USA. Values are in million pounds. Landings data are from NEFSC (1997, 1998). Export data are from Division of Economics and Statistics, NMFS, Silver Spring, Maryland.

3. HISTORY AND MANAGEMENT

²This includes protecting entitlements provided by extant property rights. For example, elsewhere the Iceland Supreme Court recently ruled in favor of a person who was denied a license in 1996 to fish in Iceland's ITQ (i.e., individual transferable quota) fishery for cod and other groundfish (Pálsson 1999). Specifically, Iceland's 15-year old ITQ policy which allocated annual harvest quotas to individual fishermen, was judged discriminatory and, therefore, unconstitutional because licenses and fishing quotas were reserved for vessels with a pre-1983 history in the fishery. Other reports in the same newsletter where Pálsson (1999) is published tell of similar challenges to ITQ policies in Canada and New Zealand by people who did not receive harvest quotas, including small boat fishermen and their communities, indigenous peoples, recreationists, and environmentalists.

¹Both Gordon (1954) and Cheung (1970) explained how overcapitalization in the "race for fish" dissipates rents when resources are non-exclusive. In addition, high policing and other transaction costs can limit benefits by influencing choice of inferior product, under-investment, and premature harvest (Cheung 1970).

The Atlantic sea scallop *Placopecten magellanicus* is a bivalve mollusc distributed throughout the Northeast Continental Shelf in the Northwest Atlantic Ocean between the Gulf of St. Lawrence, Canada, and Cape Hatteras, North Carolina, in the United States (Figure 2; Serchuk et al. 1979). Life span can be 20 years, but growth of the marketable “meat” (i.e., the adductor muscle attached to both shells) is most rapid during the first several years. For example, between age 3 when sea scallops “recruit” to the fishery - i.e., become susceptible to gear - and age 5, meat weight quadruples (NEFSC 1998). Losses in yield due to premature harvest of the non-exclusive sea scallop resource are exacerbated by dockside prices that increase with meat size, ranging from \$4.63 to \$6.89 per pound in 1998 (see footnote 1).

U.S. commercial fishing for sea scallops dates back to 1887, when a quarter million pounds of meats were harvested inshore in the Gulf of Maine by two-men crew on sailing craft outfitted with 3-foot wide oyster dredges.³ During the next 6 decades, the fishery expanded in response to consumer demand and marketing, technological innovations in power and electronics, improved gear designs, and the discovery of large offshore beds in the Mid-Atlantic during the 1920s and on Georges Bank in the 1930s. By the 1990s, offshore sea scallop vessels were powered by large (over 800 average horsepower) diesel engines, and they were “stuffed” with inputs that increased technical efficiency for open access fishing, including two dredges up to 15 feet wide each, up to 14 crew who shucked catches on-board, and state-of-the-art electronics for navigation and communication. The sea scallop fishery has been among the top fisheries in the Northeast Region of the USA (with American lobster *Homarus americanus* and groundfish) with dockside revenues topping \$200 million (1996US\$) in 1979 and 1980 and averaging \$140 million during 1977-1998.⁴

Open access prevailed for 16 years in the U.S. sea scallop fishery after the FCMA was implemented in 1977. During this period the number of full-time vessels increased eight-fold and aggregate fishing effort increased 500 percent (Figure 3). Landings and dockside revenues fluctuated with sea scallop biomass levels as well as effort, ranging from nearly 15 million pounds and \$105 million (1996US\$) in 1985 to nearly 38 million pounds and about \$180 million

(1996US\$) in 1990 and 1991. However, the fishery was dependent on incoming year classes which were depleted within a couple years.

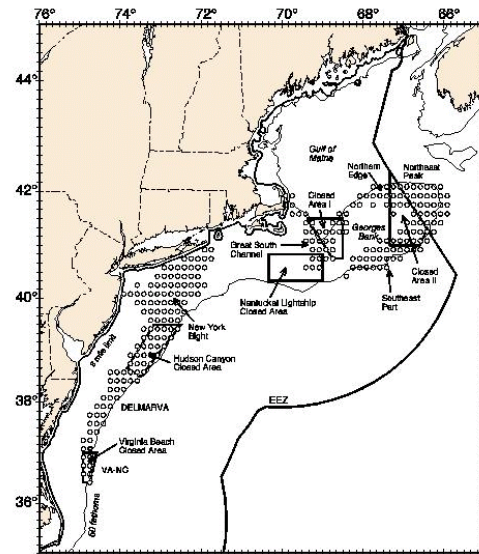


Figure 2: Distribution of Atlantic sea scallops in the Northwest Atlantic. Also shown are groundfish and sea scallop closed areas north and south of 40°N, respectively.

Absent adequate enforcement of the meat count policy, the New England Fishery Management Council’s (NEFMC) Sea Scallop Fishery Management Plan (Sea Scallop Plan), which was implemented in 1982, failed to rebuild resource biomass. Consequently, the NEFMC introduced limited entry, non-transferable individual vessel effort quotas (IVEQs), and several regulations intended to control “input stuffing,” including a 7-man crew limit, in 1994 (NEFMC 1993) and in subsequent framework adjustment actions.

Amendment 4 to the Sea Scallop Plan qualified over 400 vessels for limited entry, but the net effect of disqualifications and appeals reduced the total to 357, broken down as 264 full-time permits, 62 part-time permits, and 31 occasional permits. IVEQs were scheduled for nearly a 50 percent reduction over seven years compared to recent average levels when biomass was relatively high, including to 120 days-at-sea in the year 2000 for the full-time category.

In December, 1994, an Emergency Action taken by the Secretary of Commerce and adopted by the NEFMC closed

³See Serchuck et al. (1979) for a discussion of pre-FCMA history and for references.

⁴Other than the 1998 prices mentioned above, all monetary units are in 1996US\$.

nearly 5000 square-nautical miles of the Northeast Continental Shelf to all gear capable of catching groundfish in order to rebuild depleted stocks of Atlantic cod *Gadus morhua*, haddock *Melanogrammus aeglefinus*, and yellowtail flounder *Limanda ferruginea* (NEFMC 1996). Requests by the sea scallop fishery to regain access to Closed Areas I and II on Georges Bank and to the Nantucket Lightship Closed Area (Figure 2) have been hindered by several groups, including trawler and gillnet fishermen concerned about groundfish bycatch, lobster fishermen who had been limited in these areas by conflicts with mobile gear, and environmental organizations who single out dredge as well as trawl gear for damaging biogenic and geologic sediment structure.

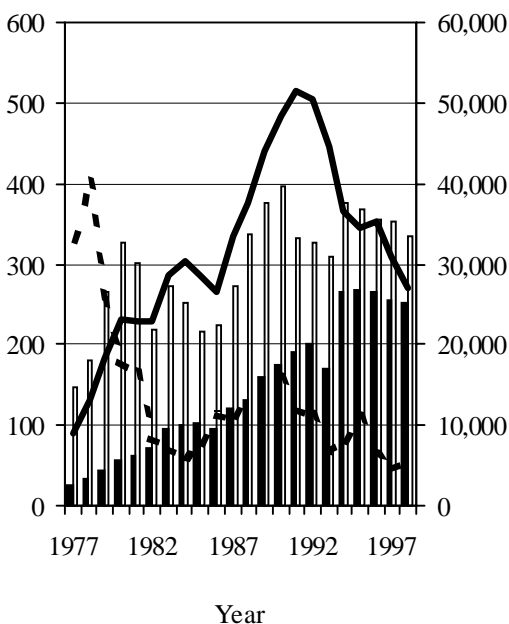


Figure 3: Number of vessels (dark bars are full-time; hollow bars are total), aggregate fishing effort (days-at-sea; solid line), and harvestable sea scallop biomass (metric tons; dashed line) in the U.S. Atlantic sea scallop fishery. Vessel numbers are on the left axis, and effort and biomass are on the right axis. Vessels that fish more than 150 days a year are considered full-time (NEFMC 1993). Swept area biomass (see text) is for the entire resource accessible to U.S. fishermen. Biomass data for 1989 are lacking.

At its December, 1997, meeting the NEFMC rejected marketable IVEQs and permit “stacking” on fewer vessels, including by companies that own more than one vessel. In addition, the NEFMC adopted the Commerce Secretary’s April, 1998, Interim Action closure of two areas in the

Mid-Atlantic - Hudson Canyon and Virginia Beach Closed Areas (Figure 2) - to protect small scallops (NMFS 1998). Together, the three groundfish and two sea scallop closed areas encompassed one-third of the sea scallop resource area and, in 1998, 85 percent of the harvestable biomass.⁵

4. RENT-CAPTURE AND DISSIPATION

A tenet of property rights theory is that rent from non-exclusive resources (or resource attributes) in the public domain attracts inputs to claim it (Barzel 1989; Cheung 1970). Acting alone or in groups, individuals can maximize their wealth either by increasing production within the extant institutional framework or by seeking changes in laws, regulations, and policies via government or private contracting (Benson 1984; Eggertsson 1990). When numbers are few and property interests are approximately equal, stakeholders can negotiate contracts allocating resources among themselves (Libecap 1989). For example, the South Atlantic Fishery Council helped Atlantic swordfish *Xiphias gladius* longliners negotiate individual transferable quotas (ITQs) in the new, small wreckfish *Polyprion americanus* fishery (Gauvin et al. 1994).

In other cases, however, the transaction costs of developing, monitoring, and enforcing exclusive property rights can be prohibitive compared to those of lobbying government for only nominal regulations and of investing in the capital inputs required to capture non-exclusive rents. This avenue, which was selected by U.S. fisheries even though the FCMA allowed for limited entry, is taken when claimants are numerous and heterogeneous and/or potential gains in wealth are skewed (Libecap 1989).

Dissipation of resource rents in the U.S. sea scallop fishery is modeled here using a simple empirical interpretation of Cheung’s (1970) conceptual model of an industry that exploits a non-exclusive fishery resource. In practice, non-exclusive rents become part of industry’s pecuniary profit. Therefore, profit, π , in the offshore sea scallop fishery was modeled as the difference between the 40 percent share of gross dockside revenue earned by vessel owners and the total of operating and fixed costs which are functions of fishing effort:

$$(1) \pi = 0.4 \cdot P(Q) \cdot Q(D, B) - 430 \cdot D - 194000 \cdot (D/d_{FT})$$

where $P(Q)$ is a market price function that includes imports as well as landings, $Q(D, B)$ is an industry production

⁵Compiled from data in Tables B6 and B7 of NEFSC (1999).

function, D is industry fishing effort (days-at-sea), B is harvestable biomass, \$430 is average operating costs per day-at-sea, and \$194 thousand is average fixed costs per vessel.⁶ d_{FT} is average annual effort by full-time vessels; therefore, D/d_{FT} is the number of full-time-equivalent vessels.

Industry production from Georges Bank and the Mid-Atlantic was modeled in Cobb-Douglas form using the generalized least squares (GLS) procedure of SAS to adjust for first-order autocorrelation:

$$(2) \ln(Q) = -0.568 + 0.707 \cdot \ln(D) + 0.489 \cdot \ln(B) - 0.200 \cdot A4,$$

(-0.96) (5.86) (4.94) (-1.82)

where t-statistics are in parentheses. $A4$ is an intercept dummy variable for the years 1994-1998 when Amendment 4 (which constrained crew size as well as fishing effort) and the closed areas (more rapid depletion of resource because vessels are crowded into smaller areas) were in effect. The regression R^2 is 0.81. The effort and biomass are significant at the 0.99 level; $A4$ is significant at the 0.90 level. Autocorrelation was not detected by the Durbin-Watson test ($DW = 1.91$ from GLS model; critical value of upper limit is 1.66 at the 0.95 level). Homoskedasticity was

⁶Fisheries data on prices, landings, and effort are from the Northeast Fisheries Science Center of NMFS in Woods Hole, Massachusetts. Import data are from the Division of Economics and Statistics of NMFS in Silver Spring, Maryland. Biomass is swept-area biomass which was calculated from biological survey indices reported in NEFSC (1997). Specifically, weights per standardized tow of the dredge were first divided by the area of a standard tow (0.001526 square miles), then multiplied by the areas of Georges Bank and the Mid-Atlantic (7456 and 8427 square-miles, respectively), and finally added. The only available cost data were from a report by Gautam and Kitts (1996) who compiled information from the federal income tax returns of vessel owners who had NMFS Capital Construction Fund loans during 1984-1993. Excluding costs for fuel, oil, ice, water, scallop bags, and food that are covered by the crew share, operating costs for gear, supplies, and repairs paid for by vessel owners averaged \$430 per day-at-sea. Fixed costs (vessel insurance, depreciation, payments toward pension and other employee benefits, salaries of corporate officers and land-based employees, half of repairs, fees for docking, storage, permits, office expenses, professional dues, utilities, rent, automobile and other travel costs, bank charges, non-income taxes, and miscellaneous dock and vessel expenses) averaged \$194,000 a year. Mortgage expenses are not included in fixed costs because of missing data.

not rejected in a Glejster test that regressed the absolute value of residuals on the regressors ($F = 1.01 < F_{(0.05),3,18} = 3.16$).

Annual dockside price was estimated as a linear function using the SAS GLS estimator:

$$(3) P = 10.24 - 0.095 \cdot S - 1.651 \cdot A4,$$

(5.60) (-2.94) (-2.74)

where t-statistics are in parentheses. S is the total quantity of sea scallops in the market, including Gulf of Maine landings (average of 1.5 million pounds during 1977-1998) and imports from Canada (average of 16 million pounds during 1977-1998); companies that buy from U.S. fishermen also import from Canada. The regression R^2 is 0.58. Each parameter is significant at the 0.99 level except that imports of other scallop products into the region was insignificant. Neither autocorrelation ($DW = 1.68$ from GLS model; critical value of upper limit is 1.66 at 0.95 level) nor heteroskedasticity ($F = 0.40 < F_{(0.05),3,18} = 3.16$) was detected.

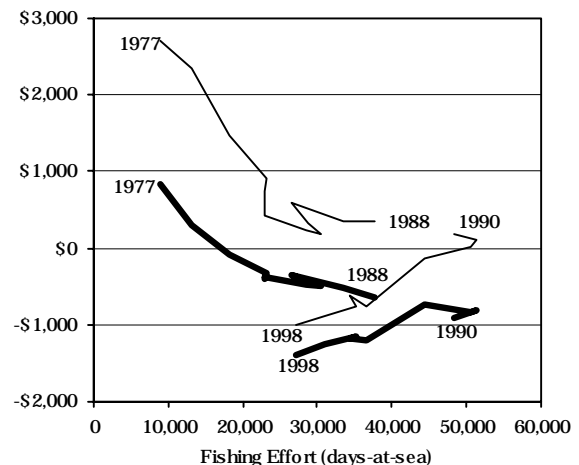


Figure 4: Estimates of the average (thin line) and marginal (thick line) profits of fishing effort.

Equation (1) was both averaged and differentiated with respect to D and then evaluated at reported values of D (Figure 4). As formulated, the annual average and marginal costs of fishing effort (including fixed costs) are equal, but varied across years depending on D/d_{FT} . Values ranged from \$1300 to \$1500 per day during 1977-1993, but increased to over \$1900 after IVEQs were introduced in 1994 because vessels risk losing their limited access permits if they do not stay in the fishery (i.e., D/d_{FT} was high).

Estimates of average industry profit (AP) and marginal industry profit (MP) are graphed on Figure 4. Hollow symbols indicate when these estimates were negative.

Within a few years as vessels entered the fishery, fishing effort approximately doubled and biomass declined (Figure 3), causing MP to be negative (Figure 4). By 1982 when the Sea Scallop Plan was implemented “*to maximize over time the joint social and economic benefits from the harvesting and use of the sea scallop resource*” (their emphasis; NEFMC 1982:74), MP was consistently negative and AP was declining.

Biomass improved between 1984 and 1990 due to recruitment of new year classes; however, a new round of entry after 1986 resulted in another doubling of fishing effort (Figure 3). AP became negative in 1993 (Figure 4) due to high fixed costs and low biomass. Owners who also captain their vessels also receive a portion of the crew share income, however.

Fishing effort declined throughout the years when limited entry and IVEQs were in effect (Figure 3), but industry profitability did not improve (Figure 4). Most of the resource biomass was located inside the groundfish and sea scallop closed areas. Furthermore, the potential to reduce fixed costs through IVEQ and permit consolidation on fewer vessels was precluded by the NEFMC.

5. ESTABLISHING PROPERTY RIGHTS

Potential rents from renewable resources cause rent-seekers to lobby for institutional change. In the sea scallop fishery, open access was maintained until fleet size consistently earned poor average and marginal profits (Figure 4) and depleted new year classes before they grew to larger, more valuable sizes. Contracting for ITQs was shelved by a committee of sea scallop industry advisors early in the development of Amendment 4 because it would take too long to resolve landings shares. IVEQs were also favored by “highline” producers because input constraints do not entirely limit production.

IVEQ transferability is opposed both inside and outside the sea scallop fishery. At stake is the distribution of at least \$27 million in profits annually⁷ and precedent in New

England where the NEFMC has shunned marketable property rights in all its fisheries. When prorated on an IVEQ basis, this profit amounts to approximately \$92 thousand for a full-time permit, \$41 thousand for a part-time permit, and \$8 thousand for an occasional permit.

Before supporting an institutional change that would increase aggregate production and wealth, an organization must foresee its welfare improved, and all parties have an incentive to maximize personal gains (Libecap 1989; North 1992). In the sea scallop fishery, two organizations in particular emerged soon after Amendment 4 was implemented to influence the NEFMC and local members of the U.S. Congress on whether and how IVEQs should be made transferable. The Fishermen’s Ad Hoc Committee, a 28-member organization in the principal sea scallop port of New Bedford, Massachusetts, formed to block transferability. This organization supported a government-financed vessel buyback program to reduce capital in the fishery, and sought to redistribute unused effort to active vessels. Three-quarters of the Fishermen’s Ad Hoc Committee’s members own either one full-time sea scallop permit (including “combination” permits in the groundfish fishery) or only dragger (groundfish) permits.

In contrast, the multi-permit members of the smaller Scallop Group Inc. from the Northeast Region’s top three major ports in Massachusetts, New Jersey, and Virginia

offshore sea scallop fishery yielded approximately 9 million pounds a year since ITQ management was implemented in 1984, leaving 20 million pounds for the USA. Adding 16 million pounds of imports from Canada and 1.5 million pounds of landings from the Gulf of Maine - figures mentioned above - to this figure results in a dockside price of about \$5.13 per pound based on equation (3) with A4. Gross dockside revenues are therefore \$103 million, \$41 million of which is vessel share. On the cost side, sea scallop industry advisors to the NEFMC think that vessels probably would average 2000 pounds per day at the unprecedented high biomass levels corresponding to maximum yield. Dividing long term annual yield by the 2000 pound catch rate results in 10 thousand days of fishing effort and \$4.3 million in operating costs. Full-time vessels averaged 203 days a year between 1977 and 1993 before IVEQs were imposed which, when divided into industry effort of 10 thousand days is 49 vessels. Thus, total fixed costs are estimated to be \$9.5 million. Total costs being \$13.8 million, profit is about \$27 million. This rough estimate could be quite conservative, however; scientists at recent technical plan development committee meetings have reported estimates of sustainable yield of 80 million pounds.

⁷This rough estimate was derived as follows. The Northeast Fisheries Science Center of NMFS reports that the long term potential yield of sea scallops from Georges Bank and the Mid-Atlantic is 29 million pounds, including from the Canadian Georges Bank (NEFSC 1998). Canada’s

lobbied for IVEQ and permit transferability.

The potential distribution of profit if IVEQs become a transferable use right is a paramount concern of the Fishermen's Ad Hoc Committee which prevailed when the Sea Scallop Oversight Committee and NEFMC rejected IVEQ transferability in 1997. Unlike members of the Sea Scallop Group Inc. who would be able to stack permits and effort quotas on fewer vessels, most scallopers would have to buy or lease additional days to make their operations technically efficient.

The potential for an asymmetric distribution of profit is apparent when permit ownership is taken into account. The 357 limited entry permits are allocated to an estimated 203 companies, including 147 companies that have 264 full-time permits.⁸ Within the full-time category, 69 percent of the 147 companies own one permit each, or 38 percent of all full-time permits. In contrast, only 9 companies own between 6 and 10 full-time permits each, which in aggregate amounts to 27 percent of total permits. The range of potential gains is therefore 10:1, or at least \$900 thousand:\$90 thousand annually.

Part-time and occasional permit holders are mostly single permit companies. Factoring in these permits, three-quarters of the 203 companies own one or fewer full-time-equivalent permits (part-time and occasional permits prorated in proportion to IVEQs), whereas just 4 percent of the companies own nearly a quarter of total permits.

Concentration of full-time-equivalent permits in the sea scallop fishery was also measured with the Herfindahl index, $H = \sum s_i^2$, where s_i is the market share of TAE owned by firm i . H approaches 1 as the number of firms decreases and/or as ownership is distributed unevenly. The prevalence of small firms in the sea scallop fishery is indicated by the small concentration index, $H=0.011$.

These results and the sea scallop industry's inability thus far to contract transferable property rights - including the inability to agree on landings shares when Amendment 4 was being developed - is consistent with results reported by Libecap and Wiggins (1984) for consolidation of oil leases in Oklahoma and Texas during 1926-1935. Common pool

losses in crude oil production resemble those in fisheries in terms of costly overcapitalization of too many wells and surface storage containers and of premature dissipation of subsurface pressure which raises extraction costs and lowers recovery rates. Total oil production and firm quotas were privately contracted within two months at the field where there were only six firms and concentration was high ($H=0.53$). In contrast, the failure to contract privately at another oil field site where there were 147 firms and $H=0.017$ lead to State regulations that were ignored by leaseholders except during periods of martial law. The similarity between the latter oil field and the sea scallop fishery is noteworthy.

6. LOOKING AHEAD

Buchanan (1980) recognized that rent-seeking theory is incorporated in the property rights school of institutions and human behavior. Property rights regimes emerge from a political process that assigns entitlements and responsibilities throughout society (Eggertsson 1990); therefore, interest groups naturally seek out government officials to define, reassign, or attenuate property rights. However, the transaction costs of contracting property rights in this way and then protecting them against other claimants can be great when diverse groups are in competition or when income distribution is skewed (Libecap 1989).

Rent-seeking in the U.S. sea scallop fishery has been steeped in a political process that allocates exclusive uses of sea scallop resources. Initially, resource access and trade disputes - including those between the U.S. and Canadian scallopers - caused the U.S. fishing industry to lobby Congress to pass the FCMA which limited access by foreign fleets to coastal marine fishery resources beginning in 1977. Many vessels subsequently entered the U.S. sea scallop fishery (Figure 3) and fished unregulated until 1982 when catch restrictions were implemented and estimates of industry's marginal profit were already consistently negative (Figure 4). Limited entry was not introduced until 1994, long after the fishery had become overcapitalized, industry average profit was negative (Figure 4), and resource stocks were depleted (Figure 3). Making effort quotas transferable would enable the industry to sell excess capital and significantly reduce fixed costs, but the asymmetric distribution of potential wealth in favor of a minority of companies with multiple permits is a major impediment.

Although too soon to assess, rent-seeking in the sea scallop fishery has recently been complicated by competition for exclusive zoning of marine resources. For example, the

⁸Ownership was approximated from unique telephone numbers and addresses reported by fishermen each year on their application to renew a limited access sea scallop permit. In those instances when the telephone numbers and addresses of settlement houses (accounting firms) were provided, NMFS port agents were able to identify owners from vessel names.

newly formed Fisheries Survival Fund organization, whose members reportedly own half of the full-time permits and include members from both the Fishermen's Ad Hoc Committee and The Scallop Group Inc., successfully lobbied the Secretary of Commerce for access to the high biomass of sea scallops in groundfish Closed Area II (Figure 2). However, the upper two-thirds of this area remained restricted because of juvenile Atlantic cod habitat and of gear conflicts with the lobster pot fishery. The scope of an emergent zoning policy is evident from the additional 40 areas that the NEFMC has designated as closed or gear-restricted in order to rebuild depleted fishery resources, to separate mobile and fixed gears, to preserve marine mammals, and to experiment with sea scallop aquaculture (see the NEFMC's website at <http://www.nefmc.org>).

Rent-seeking is not limited to pecuniary gains, however (Benson 1984). Scallopers and other fishermen now also compete with environmental groups for exclusive zoning. In addition to re-defining overfishing, the 1996 Sustainable Fisheries Act amendment to the FCMA directed Fishery Management Councils and NMFS to manage "Essential Fish Habitat" (EFH). The NEFMC prepared an omnibus EFH amendment to its Plans - developed by the Habitat Committee - whose membership includes an employee of the national Environmental Defense Fund conservation organization - that identified a "Habitat Area of Particular Concern" for juvenile Atlantic cod in Closed Area II and which also highlighted disturbance of biogenic and geologic diversity by scallop dredge gear as well as bottom trawls (NEFMC 1998). Other HAPCs are being identified by the NEFMC, including the Great South Channel of Georges Bank which is a prime scalloping ground (Figure 2). Environmental groups, such as the Center for Marine Conservation in Washington, D.C., are recommending 36 marine protected areas which encompass 29 percent of the ocean floor off the coasts of New England and Canada's Maritime Provinces, including the traditional scalloping grounds on Georges Bank (Jegalian 1999).

Rent-seeking by sea scallop fishermen has thus shifted from national exclusivity in 1977 and limited entry in 1994 to politically-granted area entitlements where sea scallop fishermen compete with environmentalists as well as other fishermen for property rights. This transition is consistent with trends observed on public lands where similar interest groups compete for federal holdings of grazing, forest, mineral, wildlife, and water resources (Boggess 1995; Gardner 1997; Nelson 1995).

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